

## **REMARKS**

This is a full and timely response to the outstanding FINAL Office Action mailed February 28, 2006. In this amendment, based on the responsive remarks in the Office Action and in an effort to place this application in condition for allowance, independent claim 38 has been amended and claims 53-54 and 57 have been cancelled.

Specifically, Applicant has amended claim 38 to more clearly identify a novel and non-obvious features of the claimed embodiments. In this regard, claim 38 is amended to add the limitations of “the slots arrange in a pattern comprising a circular pattern; a radiating pattern; a rectangular pattern, a concentric circular pattern, or a concentric octagonal pattern”. Support for these features can be found at least in Figs. 3A through 3G of the application. Accordingly, the amendment adds no new matter to the application. As this amendment is accompanied with an RCE, the amendments should be entered and fully considered.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

### **Discussion of Rejections Under 35 U.S.C. 102**

Claims 38 and 49-50 stand rejected under 35 U. S. C. 102(b) as allegedly anticipated by *Shishido et al.* (US 6,294,831). Applicant respectfully disagrees, particularly in view of the amendments made to independent claim 38.

In this regard, *Shishido et al.* teach a package with a thermally conductive structure. Specifically, the thermally conductive structure (heat spreader) 46 has a pattern of openings 48. These openings do not pierce the thermally conductive structure. (*See cover Fig. and Fig. 5(a)*). Further, the openings 48 are arranged in a grid or zigzag pattern (as described in Col.4, lines 53-58).

Independent claim 38 has been amended to recite:

38. A ball grid array package, comprising:  
a semiconductor chip/die affixed to a ball grid substrate; the ball grid substrate having a series of balls; and  
a heat spreader mounted to the semiconductor chip/die and the ball grid substrate opposite the series of balls; the heat spreader having a pattern of slots, not completely piercing the heat spreader, therein, **wherein-the slots are arranged in a pattern comprising a pattern selected from the group consisting of a circular pattern; a radiating pattern; a rectangular pattern, a concentric circular pattern, or a concentric octagonal pattern.**

(*Emphasis Added*). Claim 38 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

The Office Action acknowledged that the cover Fig. and Fig. 5(a) are cross-sections, which cannot clearly define the pattern arranged by openings disclosed by *Shishido* et al. Indeed, in Col. 4, lines 53-58, *Shishido* et al. disclose shapes of the openings 48 and 44, and the openings arrange in a grid and zigzag patterns, but do not teach or otherwise disclose the limitations emphasized above in claim 38.

Thus, Applicant respectfully asserts that the cited art is deficient for the purpose of anticipating claim 38. In particular, Applicant respectfully asserts that that cited art does not teach or otherwise disclose at least the limitations emphasized above in claim 38.

Applicant respectfully asserts that this limitation, *i.e.* the slots arrange in a pattern comprising a pattern selected from the group consisting of a circular pattern; a radiating pattern; a rectangular pattern, a concentric circular pattern, or a concentric octagonal pattern. Such a feature is not taught or reasonably suggested by any or a combination of the cited references. Therefore, Applicant respectfully asserts that claim 38 is in condition for allowance.

Since claims 39 – 52 and 55 - 56 are dependent claims that incorporate the limitations of claim 38, Applicant respectfully asserts that these claims also are in condition for allowance.

Additionally, these claims recite other limitations that can serve as an independent basis for patentability.

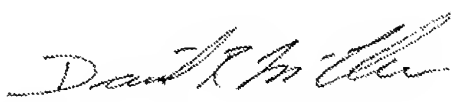
### **CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

No fee is believed to be due in connection with this Amendment and Response. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

By:



---

Daniel R. McClure, Reg. No. 38,962

**Thomas, Kayden, Horstemeyer & Risley, LLP**  
100 Galleria Pkwy, NW  
Suite 1750  
Atlanta, GA 30339  
770-933-9500